DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action
Environmental Indicator (EI) RCRAInfo code (CA725)

Current Human Exposures Under Control

Facility Name: **PolyOne Corp. Burlington Plant (fka Occidental Chemical Corporation)**
Facility Address: **1804 River Road, Burlington, New Jersey 08016**
Facility EPA ID#: **NJD043973122**

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EIs developed to date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no unacceptable human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all contamination subject to RCRA corrective action at or from the identified facility [i.e., site-wide]).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objectives of the RCRA Corrective Action program, the EIs are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993 (GPRA). The "Current Human Exposures Under Control" EI is for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and does not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determination status codes should remain in the RCRAInfo national database ONLY as long as they remain true (i.e., RCRAInfo status codes must be changed when the regulatory authorities become aware of contrary information).

Facility Information

The PolyOne Corp. Burlington Plant (fka Occidental Chemical Corporation [OCC]) is located in an industrial area of Burlington, New Jersey north of the confluence of Bustleton Creek and the Delaware River. The site occupies 187 acres adjacent to the Delaware River at 1804 River Road. The site is bounded on the west by the Delaware River, on the north by the National Gypsum Company, and to the south and east by vacant land covered by shrubs and trees. Farther to the east is a light industrial and commercial area adjacent to Route 130 (Ref. 2).

The facility has operated as a resin production and packaging, and product manufacturing facility since construction in 1967. The facility currently manufactures polyvinyl chloride (PVC) compounds and calendered film. The production of PVC resin was discontinued in July 1990. An embossed and printed fabric production process was discontinued in 1976. The production area occupies approximately 32 acres in the northern portion of the western half of the property. The remaining portions of the property consist of unused open and wooded areas (Ref. 2).

The Colorado Fuel & Iron Corporation owned the property from 1963 to 1966. The site was vacant and used for agricultural purposes until Hooker Chemical (for which OCC became corporate successor in 1982) purchased the property in 1966 and constructed the first industrial structure at the site in 1967. The facility was acquired by the Geon Company on May 1, 1999. The Geon Company and M.A. Hanna merged to become PolyOne Corp., effective September 1, 2000.

According to the Site Investigation (SI) Report, the facility is a RCRA Small Quantity Generator. There are no RCRA-regulated treatment, storage, or disposal units at the facility. OCC initiated an Environmental Cleanup and Responsibility Act (ECRA) investigation of the site in February 1989 as a prelude to selling the property. OCC is currently under a Remediation Agreement with the New Jersey Department of Environmental Protection (NJDEP) (Ref. 1). OCC has performed an SI, a Remedial Investigation (RI), and a Supplemental Remedial Investigation (SRI) at the site to investigate impacts to on- and off-site environmental media due to historic activities at the site. The SRI documents the proposed remedial actions at the site. NJDEP has verbally approved the SRI Report (Ref. 3). OCC will perform all the remedial activities presented in the SRI; however, PolyOne will work simultaneously with OCC to conduct additional remediation at the site to remove all impacted soil above the New Jersey Residential Direct Contact Soil Cleanup Criteria (NJ RDCSCC). PolyOne will conduct this additional remediation to the more stringent cleanup criteria (NJ RDCSCC) in order to avoid the need for a Deed Notice for the property (Ref. 3). Remedial actions (e.g., excavation) began in February 2002 (Ref. 3).

1. Site Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated March 19, 1999.
2. Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated October 12, 2000.
3. Telephone conversation between Elizabeth Butler, USEPA, and Richard Burgos, NJDEP. February 4, 2002.

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   _X_ If yes - check here and continue with #2 below.

   ____ If no - re-evaluate existing data, or

   ____ If data are not available skip to #6 and enter IN (more information needed) status code

Summary of AOCs: Based upon historical activities at the site, several AOCs have been identified and investigated during the SI (1999), RI (2000), and SRI (2001). Generally, the AOCs identified at the site are based on two primary categories of identified contamination:

(1) The *Surface Ditch System*, which has been impacted by the release of polychlorinated biphenyls (PCBs) along with *other PCB-impacted areas*,

(2) *Volatile organic compound (VOC) source areas*, which have impacted on-site soil, groundwater, and downgradient surface water.

For a figure showing the layout of the site and the AOCs discussed below, refer to the Master Site Plan (Drawing No. 1) in the RI Report (Ref. 3).

SURFACE DITCH SYSTEM AND OTHER PCB-IMPACTED AREAS

Resin Ditch/South Ditch/Corrugated Metal Piping (CMP) and Catch Basins (CB): Wastewater from plant processes was discharged to an on-site ditch conveyance system under a New Jersey Pollutant Discharge Elimination System (NJPDES) permit until mid-1987. Sediments[1] would accumulate in the ditch system and were removed periodically after characterization sampling. In late 1998 and early 1999, characterization sampling detected PCBs (primarily Aroclor 1242) in ditch soil at concentrations up to 200 mg/kg. Results from the initial investigation, and subsequent soil investigations conducted during the RI and SRI, indicate that most of the PCB soil contamination was found in the on-site Resin Ditch (non-detect [ND] to 310 mg/kg), and to a lessor extent in the on-site South Ditch (ND to 45 mg/kg). The source of PCBs in the surface ditch system is believed to be spills or leakage from the maintenance of heat transfer units formerly located in the northwest corner of the Compound Building (Ref. 3). PCBs were also detected in soil at the influent and effluent locations of the underground CMP (maximum of 25 mg/kg) and CBs (maximum of 72 mg/kg) along the CMP that extends from the Compound Building. Although PCB concentrations in ditch soil are above the NJ NRDCSCC, the levels are not a concern for exposure because the ditch areas are fenced and are not accessible to receptors at the site. The CMP and CB areas are also not likely to be a concern for direct exposure because they are below ground within the subsurface drainage piping system. It should be noted that all soil impacted with PCBs above NJ RDCSCC[2] (0.49 mg/kg) will eventually be

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[1] For purposes of this EI, sediments in the ditch system will be discussed as on-site soil because they have been evaluated against New Jersey **Soil** Cleanup Criteria (SCC) (e.g., NJ RDCSCC and New Jersey Non-Residential Direct Contact Soil Cleanup Criteria [NJ NRDCSCC]) for exposure analysis and because they have not been identified as a concern for ecological receptors.

[2] The NJ NRDCSCC are considered the relevant screening criteria for this site given that the site is an active industrial facility. OCC proposed to remediate soil at the site to relevant industrial cleanup criteria (i.e., NJ NRDCSCC or NJDEP-approved site-specific criteria). However, PolyOne has proposed to further remediate soil down to unrestricted use criteria (NJ RDCSCC) in order to avoid the need for a Deed Notice at the site which would restrict future use to non-residential only. Thus, PolyOne will work with OCC to remediate soil at the site to the NJ RDCSCC.

excavated to avoid having a Deed Notice in place at the site. This includes all impacted soil in the CMP and CBs. Excavation of impacted soil began in February 2002 (Ref. 8).

Transformers : Five transformers were located at buildings throughout the site as described below. The RI indicates no documented spills or leaks have been identified at any of these transformers.

Fabric Transformer (Building 30): Soil sampling performed during the RI detected PCBs in surface soil ranging from 1.5 to 22 mg/kg. Additional soil samples were collected during the SRI and PCB results ranged from ND to 2.1 mg/kg in surface soil, only slightly above the NJ NRDCSCC (2 mg/kg).

Silo/Oil Compound Transformer (Building 37): Soil sampling performed during the RI detected PCBs in surface soil ranging from 1.2 to 13 mg/kg. All PCB concentrations were below the NJ NRDCSCC (2 mg/kg) in additional samples collected during the SRI.

Utility Transformer (Building 4/4A): Soil sampling performed during the RI detected PCBs in surface soil ranging from 0.12 to 2.0 mg/kg. Given that the maximum detection (2.0 mg/kg) was equivalent to the NJ NRDCSCC for PCBs, this area was determined to be fully delineated and no additional sampling was required.

Main Transformer (Building 23): Soil sampling performed during the RI detected PCBs in this area ranging from ND to 0.21 mg/kg, below the NJ NRDCSCC.

Recovery Transformer (Building 17): Soil sampling performed during the RI detected PCBs in surface soil ranging from 4.7 to 9.2 mg/kg. All PCB concentrations were below the NJ NRDCSCC in additional samples collected during the SRI.

All PCB-impacted soil at each of the transformer areas described above are located within a fenced/secured area, with the exception of one surface soil sample location at the Fabric Transformer Area (PS-62, 0-0.5 ft) that is located just outside the fence line (PCBs detected at 2.1 mg/kg) (Ref. 3). Thus, there is a potential concern that on-site receptors may be exposed to this PCB-impacted surface soil outside the fenced area. All soil impacted with PCBs above the NJ RDCSCC (0.49 mg/kg) will eventually be excavated to avoid having a Deed Notice in place at the site. Excavation of impacted soil began in February 2002 (Ref. 8).

VOC SOURCE AREAS

Former Vinyl Chloride Monomer (VCM) Recovery Area: VCM was used in the PVC resin production process. Condensate containing VCM from the steaming portion of the resin production process was discharged to the ground surface near the Resin Building prior to 1978. After 1978, the condensate was treated on site prior to discharge. Soil in this area was sampled during the SI and RI for tetrachloroethene (PCE), trichloroethene (TCE), 1,2-dichloroethene (DCE), and VCM. PCE was the only contaminant detected, but it was detected at concentrations below the NJ RDCSCC and NJ NRDCSCC. NJDEP concurred that no further investigation[3] of soil was required in this area (Ref. 4).

[3] NJDEP has indicated that no further investigation is necessary at various AOCs at the site. No further investigation simply implies that contaminant concentrations have been adequately delineated at the current time and no additional sampling is necessary. This is different from a No Further Action determination which indicates that no further remedial action is necessary at an AOC. Based upon available information, NJDEP has not issued any No Further Action determinations for AOCs at this site.

Former PCE Drum Storage Area: 55-gallon drums of PCE were used for cleaning equipment in the Calendar Building. The drums were stored on the east side of the Calendar Building. In March 1983, PCE was detected in the groundwater in this area (Ref. 3). Since that time, PCE has been purchased in five-gallon containers to minimize the amount of solvent present at one time and to provide greater material control to eliminate releases from spills or leaks. Soil samples were collected during the SI and analyzed for PCE, TCE, 1,2-DCE, and VCM. Although PCE was detected, concentrations were below the NJ NRDCSCC. Additional soil samples were required as part of the RI. Results indicated PCE (20 mg/kg) was present in surface soil above NJ RDCSCC (4.0 mg/kg), NJ NRDCSCC (6.0 mg/kg), and New Jersey Impact to Groundwater Soil Cleanup Criteria (NJ IGWSCC) (1.0 mg/kg) at one sample location (PS-25), and above only the NJ IGWSCC (1.0 mg/kg) in surface soil at one other sample location (PS-24). The RI and SRI indicate that the PCE detected in this area was likely the result of a small spill and did not require any additional investigation. NJDEP concurred that no further investigation of soil was required in this area (Ref. 4). According to the Surface Characterization Map (Figure 1.3) in the SI Report (Ref. 1), this area is covered by concrete or pavement. The Former PCE Drum Storage Area was located just to the right of Building 2 on Figure 1.3. Thus, current exposure to elevated levels of PCE in this area is not a concern. The SRI Report indicates that this area will be included in the Classification Exception Area (CEA) to address the historic presence of PCE in groundwater. In addition, all soil impacted with PCE above the NJ RDCSCC (4 mg/kg) will eventually be excavated to avoid having a Deed Notice at the site. Excavation of impacted soil began in February 2002 (Ref. 8).

Chiller House: According to the SI Report, trichlorofluoromethane (TCFM), historically used at the Chiller House as a refrigerant, was suspected to be the source of TCFM sporadically detected in shallow groundwater. However, TCFM has not been recently detected in groundwater and is no longer identified as a constituent of concern (COC). Low levels of PCE and VCM have been detected in shallow well nest MW-2 (in the vicinity of the Chiller House) in recent groundwater sampling (2000). However, only PCE (23 μg/L in MW-2S) remains above NJ GWQC (1 μg/L). Soil samples were collected adjacent to the Chiller House during the SI and RI. Samples were analyzed for TCFM, PCE, TCE, 1,2-DCE, and VCM. PCE was the only contaminant detected (ND to 9.6 mg/kg). PCE was detected in the subsurface (3.5 to 6.0 feet below ground surface [bgs]) above the NJ NRDCSCC (6.0 mg/kg) and the NJ IGWSCC (1.0 mg/kg) at two sample locations. Therefore, this area was not identified as a concern for direct contact to on-site workers. However, on-site construction workers could potentially be exposed to elevated levels of PCE while performing intrusive activities in this area. The SRI Report indicates that this area will be included in the CEA to address the historic groundwater impacts in this area. In addition, all soil impacted with PCE above the NJ RDCSCC (4 mg/kg) will eventually be excavated to avoid having a Deed Notice at the site. Excavation of impacted soil began in February 2002 (Ref. 8).

Four Former Underground Storage Tanks (USTs): Four USTs were located at the facility as described below.

> **10,000 gallon Unused Tank:** This tank was installed in a concrete vault in 1978 for VCM recovery, but was never used. It was abandoned in place. Given no products were stored in this tank, this tank is not a concern (Ref. 3).
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> **50,000 gallon No. 6 Fuel Oil Tank:** This tank is located north of the Boiler House and was installed in 1966. According to the RI, the tank was filled with concrete and soil, and clean closed pursuant to an approved closure plan (Ref. 3). Given that clean closure was documented, this area was not investigated in the RI (Ref. 3).

Two 1,000 gallon No. 2 Fuel Oil Tanks: One tank, located under the concrete floor of the Resin Building, was closed in place by filling with concrete in 1975. According to the SI, this tank was clean closed and thus was not determined to be a concern (Ref. 1). The second tank was located east of the Resin Building and was removed in the late 1980s. The RI Report indicates that no documentation could be found that provided details of the closure and dimensions for this tank. Soil samples were collected in the area of this second tank during the SI and RI. PCE was detected (maximum of 4.0 mg/kg) at concentrations below the NJ NRDCSCC (6.0 mg/kg). Thus, this area is not currently a direct exposure concern. The RI and SRI Report indicate that this area will be included in the CEA application given that the PCE concentrations in soil were slightly above the NJ IGWSCC (1.0 mg/kg). NJDEP concurred that no further investigation of soil was required in this area (Ref. 4). In addition, all soil impacted with PCE above the NJ RDCSCC (4 mg/kg) will eventually be excavated to avoid having a Deed Notice at the site. Excavation of impacted soil began in February 2002 (Ref. 8).

Welex Building: PCE was used in the Welex Building for equipment cleaning. Because PCE was detected at elevated concentrations in shallow well nest MW-5, soil samples were collected during the SI in this area and analyzed for PCE, TCE, 1,2-DCE, and VCM. No constituents were detected. NJDEP concurred that no further investigation of soil was required in this area (Ref. 4). PCE (maximum of 220 μg/L) and TCE (maximum of 2 μg/L) have been detected in groundwater during recent groundwater sampling events (Third and Fourth Quarter 2000) above New Jersey Ground Water Quality Criteria (NJ GWQC) for Class II-A potable groundwater. This area is being included in the CEA and an active groundwater remediation system (air sparging or density driven connection [DDC]) system will be initiated in this area (expected in Spring 2002) to further reduce the concentration of VOCs in groundwater (Refs. 3, 6).

Empty Drum Storage Area: This area, located north of the Warehouse, was used to store empty drums. A portion of the area is covered with gravel and the balance is covered with asphalt. Soil samples were collected during the SI and analyzed for PCE, TCE, 1, 2-DCE and VCM. No constituents were detected. NJDEP concluded that no further investigation of soil was required in this area (Ref. 4).

Obsolete Equipment Storage Area: This area, located just outside of the Resin Building, was used to store obsolete equipment. The SI and RI Reports also indicate that PCB-impacted soil historically removed from the Resin Ditch and South Ditch was once temporarily staged in this area. Soil samples were collected during the SI and RI and analyzed for PCBs, PCE, TCE, 1, 2-DCE, and VCM. PCE was the only contaminant detected, but concentrations were below the NJ RDCSCC, NJ NRDCSCC, and the NJ IGWSCC. NJDEP concurred that no further investigation of soil was required in this area (Ref. 4).

Resin Building: PVC Resin was produced in this building from 1968 to July 1990. The SI Report indicates that chemicals used in the Resin Building could have penetrated the building floor and impacted underlying soil. Soil samples were collected during the SI and analyzed for PCE, TCE, 1,2-DCE and VCM. PCE was the only contaminant detected, but concentrations were below the NJ RDCSCC, NJ NRDCSCC, and NJ IGWSCC. NJDEP concurred that no further investigation of soil was required in this area (Ref. 4).

Bulk Storage Tanks: According to the SI, 16 bulk storage tanks are utilized throughout the site. All of the bulk storage tanks, with the exception of the 300,000-gallon Aboveground No. 6 Fuel Oil Tank, are located within paved/concrete areas that have had secondary containment since their date of installation. All tanks have also been subject to integrity testing and results have shown no leaks. The 300,000-gallon Aboveground No. 6 Fuel Oil Tank is located southeast of the parking lot and is underlain by clay. Surface soil samples were collected during the SI and

results indicated that one of two samples (AST-1) contained 20,900 mg/kg total petroleum hydrocarbons (TPH). Additional samples were collected during the RI; however, all results (maximum of 38.0 mg/kg) were well below the NJDEP-approved cleanup criterion for TPH (10,000 mg/kg). Thus, the RI Report concludes that the elevated concentration (20,900 mg/kg at AST-1) was a localized impact given that the sample was collected beneath the tank valving from soil overlying the clay liner, and surrounding samples were all well below the elevated concentration detected at AST-1. The area where the 300,000-gallon Aboveground No. 6 Fuel Oil Tank is located is surrounded by fencing, and thus is not a concern for direct exposure. The RI Report proposed to excavate soil in the vicinity of sample location AST-1 down to the top of the clay liner, in order to remove all TPH-impacted soil above 10,000 mg/kg (Ref. 5). NJDEP approved this recommended remedial action (Ref. 4). Excavation of impacted soil began in February 2002 (Ref. 8).

Current Drum Storage Areas: Drums containing hazardous substances or hazardous waste are stored either inside the buildings or at other areas with secondary containment. The secondary containment consists of either containment dikes or prefabricated containment pads. According to the RI, there are no designated areas for drum storage within buildings. Although there may have been small volumes of chlorinated solvents stored inside buildings, the RI Report indicates that these materials were not stored adjacent to building floor drains. The RI Report also documents that many of the floor drains have been sealed. Thus, the RI Report indicates this area was not a concern given that the floor drains have been sealed and that the buildings provide secondary containment. NJDEP concurred that no further investigation was required in these areas (Ref. 4).

Process Lines/Equipment/Material Handling Areas: VCM was historically shipped to the site by rail car. The material was off-loaded and pumped to a VCM sphere and stored as a liquid (Ref. 3). The RI indicates that the methods used during off-loading provided low possibility of VCM leakage/spillage to the ground. Soil samples were collected during the RI for VCM and no contamination was detected. Thus, the RI Report indicates these areas were not a concern. No other areas of concern were identified at the site relative to process lines/equipment/material handling areas based upon the physical features and procedures used to prevent chemical releases. NJDEP concurred that no further investigation was required in these areas (Ref. 4).

Groundwater: Three principal hydrogeologic units are present in the unconsolidated sediment beneath the site: the shallow aquifer (Cape May Formation), the confining clay aquitard (low permeability clay layer), and the Potomac-Raritan-Magothy (PRM) Aquifer. Historic activities at the site have impacted the shallow aquifer. Currently, only PCE and TCE are detected in shallow groundwater at concentrations above the NJ GWQC. The most significant impacts have been detected in well nest MW-5 and slightly upgradient, beneath the Welex Building. Several potential source areas for PCE impacts to groundwater have been identified at the site, including: soils in the area of the Chiller House, the Former PCE Drum Storage Area, and the Former UST located adjacent to the Resin Building. PCE was detected in soil in each of these areas above the NJ IGWSCC of 1 mg/kg. The extent of contamination in each area is considered to be relatively minimal (maximum of 20 mg/kg in the Former PCE Drum Storage Area) and is not believed to provide significant sources of contamination based on the infrequent and low level concentrations detected in the groundwater located downgradient of these areas. The proposed remedial strategy presented in the SRI will implement either an air sparging system or a DDC system near the area of well nest MW-5 and upgradient thereof. The CEA application indicates that this active remediation system will reduce VOC concentrations at greater rates than have been being observed through natural attenuation. Installation of the system in less contaminated areas is not proposed because natural attenuation is significantly reducing VOC concentrations prior to discharge at Bustleton Creek (Refs. 3, 5, 6). A CEA application also addresses impacted areas in the shallow aquifer. The CEA boundary extends from immediately north of the site's facilities

(i.e., buildings) where releases may have occurred (as discussed above), and extends south and southwest to the Bustleton Creek and the Delaware River, which is the current extent of the PCE plume. In addition, the CEA indicates that a groundwater monitoring program will be re-established at the site as part of the proposed remediation system. The proposed monitoring strategy includes MW-5S/5D (quarterly), MW-6S/6D (annually) and MW-8S/8D (annually), as well as PW-1 and PW-2 according to Safe Drinking Water Act (SDWA) requirements.

The bottom of the shallow aquifer is defined by the low permeability clay layer. The presence of the confining clay between the shallow aquifer and the PRM aquifer effectively prevents vertical migration in the area of the site (Ref. 4). Two production wells (PW-1 and PW-2) are utilized at the site and withdraw groundwater from the PRM aquifer. PW-1 and PW-2 have been sampled during selected quarterly events in 1998, 1999, and 2000. No VOCs have been detected in PW-1, while PCE has been detected in PW-2 at a maximum concentration of 2 μg/L during sampling events conducted from May 1998 to November 2000 (Ref. 2). The RI Report indicates that PCE contamination detected in PW-2 is not site related, but is representative of general groundwater conditions in the industrial area within which the site is located (further discussed in Questions #2 and #3).

In summary, there are several areas for which remedial actions are planned and documented in the RI and SRI Reports. These include: excavation of PCB-contaminated soil in the area of the Resin and South Ditch; excavation of TPH-impacted soil in the area of the 300,000-gallon Aboveground No. 6 Fuel Oil Tank; and development of a CEA which includes the areas of the Chiller House, Former Drum Storage Area, and Former 1,000-gallon No. 2 Fuel Oil UST Area. The CEA application also proposes to install a groundwater remediation system to reduce concentrations of contamination in groundwater in the area of well nest MW-5 and implementation of a groundwater monitoring program. All other areas of concern identified and investigated at the site have been determined to require no additional investigation at this time. As previously noted, OCC has proposed to remediate the site to the currently relevant NJ SCC (i.e., industrial criteria). However, PolyOne, the current site owners, will remediate all impacted areas at the site to the more stringent unrestricted use criteria (i.e., NJ RDCSCC) to avoid having a Deed Notice at the site. Thus, OCC and PolyOne will be working in conjunction to remediate the site to desired levels.

References:

1. Site Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated March 19, 1999.
2. Well Search Results, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated May 21, 1999.
3. Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated October 12, 2000.
4. Letter from Wayne Howitz, NJDEP, to David P. Steele, Glenn Springs Holdings, Inc., re: Remedial Investigation Report, dated October 12, 2000, Draft Response to Draft Comments on the RI Report dated January 19, 2001. Dated August 13, 2001.
5. Supplemental Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated September 7, 2001.
6. Addendum to RI Report, Classification Exception Area, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated September 7, 2001.
7. Letter from David Steele, Glen Springs Holdings, Inc., to Richard Burgos, NJDEP, re: Responses to Comments on the Remedial Investigation Report. Dated September 10, 2001.
8. Telephone conversation between Elizabeth Butler, USEPA, and Richard Burgos, NJDEP. February 4, 2002.

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be "**contaminated**"[4] above appropriately protective risk-based levels (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	X			PCE, TCE
Air (indoors)[5]		X		
Surface Soil (e.g., <2 ft)	X			PCE, PCB, TPH
Surface Water		X		
Sediment[6]	X			PCB
Subsurface Soil (e.g., >2 ft)	X			PCE, PCB
Air (Outdoor)		X		

____ If no (for all media) - skip to #6, and enter YE, status code after providing or citing appropriate levels, and referencing sufficient supporting documentation demonstrating that these levels are not exceeded.

__X__ If yes (for any media) - continue after identifying key contaminants in each contaminated medium, citing appropriate levels (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

____ If unknown (for any media) - skip to #6 and enter IN status code.

Rationale:

Groundwater

Three principal hydrogeologic units are present in the unconsolidated sediment beneath the site: the shallow aquifer (Cape May Formation), the confining clay aquitard (low permeability clay layer), and the Potomac-Raritan-Magothy (PRM) Aquifer. Numerous investigations have been conducted to investigate the groundwater migration pathways at the site. According to the CEA application, infiltrating precipitation migrates downward through the unsaturated zone to the water table in the shallow aquifer beneath the site. Groundwater in the shallow aquifer flows in a southwest direction, towards Bustleton Creek, at an average velocity of approximately one foot per day. The shallow aquifer is continuous across the site and averages 35 feet in thickness. The bottom of the shallow aquifer is defined by the low permeability clay layer. The groundwater in the shallow aquifer discharges primarily to Bustleton Creek,

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[4] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[5] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggests that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

[6] The sediment in the Surface Ditch System is being evaluated as soil. Sediment in this table refers only to sediment in Bustleton Creek.

which then discharges to the Delaware River. A relatively small amount of groundwater discharges directly to the Delaware River. However, water level and groundwater chemistry data have shown that Bustleton Creek acts as a groundwater discharge zone; thus, groundwater in the shallow aquifer is prevented from migrating south of (beyond) Bustleton Creek. The vertical gradients in the shallow aquifer are primarily downward, and are minimal in magnitude. The presence of the confining clay between the shallow aquifer and the PRM aquifer has been determined to effectively prevent vertical migration in the area of the site (Ref. 4).

Groundwater sampling was initiated in 1983 following the detection of VCM in the surface water of Bustleton Creek. Groundwater monitoring has been performed at two depths in the shallow aquifer, one near the water table (designated as "shallow") and one near the base of the shallow aquifer (designated as "deep"). Groundwater monitoring has been conducted quarterly from February 1988 through November 2000 at well nests MW-1 through MW-6, MW-8, and MW-9 pursuant to the NJDEP Discharge to Groundwater (DGW) permit. Well nest MW-7 was abandoned in April 2000 per NJDEP approval. All groundwater monitoring ceased in November 2000 with NJDEP approval.

The primary constituents historically detected in groundwater beneath the site are PCE, TCE, 1,2-DCE, and VCM. Concentrations of these constituents have historically ranged from ND to the 600 μg/L range, but have declined significantly over time as shown by the past 16 years of quarterly monitoring (Refs. 1, 3). 1, 2-DCE and VCM concentrations have declined to concentrations below NJ GWQC. PCE is currently detected at a majority of the wells on site at concentrations ranging from 1.0 to 26 μg/L; however, MW-5S and MW-6D have historically shown higher than average concentrations (up to 220 μg/L and 47 μg/L, respectively, in November 2000) (Ref. 2). TCE is currently reported in lower concentrations over smaller areas. Natural attenuation of PCE and TCE is occurring at the site. However, the contribution of destructive natural attenuation processes is nominal and localized. Table 1 presents contaminants detected above NJ GWQC during two most recent groundwater sampling events (Third and Fourth Quarter 2000) (Ref. 4).

Table 1 - Maximum Concentration of Contaminants Detected in the Shallow Aquifer Above the NJ GWQC in Third and Fourth Quarter [1] 2000 (μg/L)

Contaminant	NJ GWQC [2]	Third Quarter 2000		Fourth Quarter 2000	
		Max Conc.[3]	Wells Above NJ GWQC [4]	Max Conc.[3]	Wells Above NJ GWQC [4]
PCE	1	160	MW-1S, MW-2S, MW-3S/3D, MW-4S, **MW-5D**, MW-6S/6D, MW-8D, MW-9S/D, TW-20	220	MW-1S, MW-2S, MW-3S/3D, MW-4S, **MW-5D**, MW-6S/6D, MW-8D, MW-9S/D, TW-20, PW-2
TCE	1	2.0	**MW-3S, MW-5D, MW-6S**, MW6D	2.0	**MW-3S, MW-5D, MW-6S**

[1] Samples collected during August and November 2000
[2] Criteria listed are the higher of NJ GWQC and the Practical Quantitation Level (PQL)
[3] Concentrations in summary tables were rounded to the nearest whole number (Ref. 4)
[4.] Well locations where maximum detected concentrations were found are in **Bold**

PW-1 and PW-2 are on-site production wells completed in the PRM aquifer. PW-1 is the primary production well used at the plant. PW-2 is used only during periods requiring additional water for heat exchange (i.e., during the hot summer months) (Ref. 1). PW-1 and PW-2 have been sampled during selected quarterly events in 1998, 1999, and 2000. No VOCs have been detected in PW-1, while PCE has been detected in PW-2 at a maximum concentration of 2μg/L during sampling events conducted from May 1998 to November 2000 (Ref. 2). The RI Report indicates that PCE contamination detected in PW-2 is not site related, but is representative of general groundwater conditions in the industrial area within which the site is located (discussed further in Question #3).

Groundwater monitoring ceased at the site in November 2000. The CEA indicates that an active remediation system will be installed in the vicinity of well nest MW-5 and immediately upgradient locations (i.e., in the area of the Welex Building) to accelerate the removal of VOCs (Ref. 4). In addition, a groundwater monitoring program will be re-established at the site as part of the proposed remediation system. The proposed monitoring strategy includes MW-5S/5D (quarterly), MW-6D (annually) and MW-8D (annually) (Ref. 4). NJDEP approval of the CEA application will be provided upon activation and documented adequacy of the proposed remediation system (Ref. 5).

Air (Indoors)

The depth to groundwater in the shallow aquifer ranges from approximately 8 to 17 feet bgs. Given the depth to the top of this contaminated unit, the maximum concentrations of VOCs detected in the shallow aquifer during the recent groundwater monitoring events (Third and Fourth Quarter 2000) (Ref. 4) were compared to the State of Connecticut Groundwater Standards for Protection of Indoor Air under the Industrial/Commercial (CT I/C VC) scenario. This comparison is used to identify constituents that may be a concern for potential migration into indoor air. Table 2 displays the maximum concentration of contaminants detected in groundwater and their associated CT I/C VC.

Table 2 - Comparison of Recently Detected Maximum Groundwater Contaminant Concentrations to the CT I/C VC (μg/L)

Contaminant	CT I/C VC	Max. Concentration
PCE	3,820	220
TCE	540	2.0

As shown in Table 2, there are currently no VOCs present in the shallow aquifer above the CT I/C VC. Thus, it does not appear that concentrations in groundwater could adversely impact indoor air based upon current site conditions.

Surface/Subsurface Soil

Several soil investigations (SI, RI, SRI) have been conducted throughout the site. Based upon soil sampling results, there are several areas at the site where contamination is currently present above relevant NJ SCC (and/or other relevant cleanup criteria) (Refs. 1, 2, 3). These locations are identified in Table 3, along with the maximum detected concentration in each area and the approximate depth where contamination is present above the relevant criteria.

Table 3 - Maximum Detected Concentration of Contaminants in Soil above NJ SCC (mg/kg)

Area	Contaminant	Max. Conc.[1]	Av. Depth of Contamination	NJ RDCSCC[2]	NJ NRDCSCC[2]	NJ IGWSCC[2]
Surface Ditch System and Other PCB-Impacted Areas						
Resin Ditch	PCB	310 (SI)	0-5 ft	**0.49**	**2.0**	**50**
South Ditch	PCB	45 (SI)	0-2 ft	**0.49**	**2.0**	50
Below Grade Piping (CMP and CB)	PCB	25 (CMP) (RI) 72 (CB) (SRI)	In Pipe In CB	**0.49**	**2.0**	**50**
Fabric Transformer Area	PCB	22 (SRI)	0.0 - 0.5	**0.49**	**2**	50
Silo/Compound Transformer Area	PCB	13 (SRI)	0.0 - 0.5	**0.49**	**2**	50
Utility Transformer Area	PCB	2.0 (RI)	0.0 - 0.5	**0.49**	2	50
Recovery Transformer Area	PCB	9.2 (SRI)	0.0 - 0.5	**0.49**	**2**	50
VOC Source Areas						
Former PCE Drum Storage Area	PCE 20 (RI)	20 (RI)	1.5 - 2.0	**4**	**6**	**1**
Chiller House	PCE	9.6 (RI)	3.5-6.0	**4**	**6**	**1**
Former UST (1,000 gallon No. 2 Fuel Oil Tank)	PCE	4.0 (RI)	Subsurface[3]	4	6	**1**
Bulk Storage Tank (300,000 gallon Aboveground No. 6 Fuel Oil Tank)	TPH	20,900 (SI)	0.0 - 0.5	**10,000**[4]		

[1] Maximum concentration is followed by the time of sampling identified in parenthesis (i.e., SI, RI or SRI)
[2] Criteria in bold are exceeded at the designated area.
[3] RI only indicates the sample was collected in the subsurface. Specific depth not identified.
[4] NJDEP-approved site-specific cleanup criterion.

As identified in Table 3, PCBs, PCE, and TPH are the only constituents currently present in soil at the site above applicable NJ SCC.

Surface Water/Sediment

The Delaware River and Bustleton Creek are the only two significant surface water bodies located within one-half mile of the site (Ref. 1). Groundwater in the shallow aquifer beneath the site flows southwesterly and primarily into Bustleton Creek, which in turn discharges to the Delaware River. Bustleton Creek flows westward into the Delaware River just south of the southern property boundary. In the vicinity of the site, Bustleton Creek consists of a series of long, shallow pools (less than six inches deep) with little net flow. Bustleton Creek is tidally influenced in the vicinity of the site. However, the intensity of tidal fluctuation weakens and only extends approximately half-way to the east end of the property (Ref. 1).

Initial surface water monitoring detected VCM in Bustleton Creek in 1983 at concentrations up to 740 μg/L. Surface water monitoring is conducted quarterly pursuant to the NJPDES permit (Ref. 2). Quarterly sampling and analyses conducted through the fourth quarter of 1989 show that by the end of 1989, the surface water contaminant concentrations were non-detect. VCM was not detected in the RI

surface water samples collected in April 2000. PCE was the only contaminant detected in surface water during the RI, at a concentration of 1.0J μg/L at one sample location (BC-2) (Ref. 2). The SI Report indicates that the site is within the Delaware River Basin, thus the Delaware River Basin Commission (DRBC) standards apply. The Freshwater Standard for Fish and Water Ingestion for PCE is 0.80 μg/L, while the Fish Ingestion Only standard is 8.85 μg/L. The SI indicates that there is no consumption of surface water from Bustleton Creek or the Delaware River in the vicinity of the site, therefore the fish ingestion standards apply. The RI Report indicates that the NJ Surface Water Quality Criteria (NJ SWQC) are not applicable to Bustleton Creek as they pertain to human health impacts associated with consumption of drinking water, and Bustleton Creek is not used as a source of drinking water. Thus, given the detected concentration of PCE (1.0J μg/L) was less than the applicable DRBC standard (8.85 μg/L), surface water is not currently considered impacted above relevant criteria. PCBs were also included in the parameter list for surface water in first quarter 1989. PCBs were not detected in this event; thus, PCBs were not deemed a concern in surface water (Ref. 2). PCBs were not included in the parameter list during recent surface water sampling events (Ref. 2).

SI and RI analytical results indicate the presence of limited concentrations of PCBs in the sediment of Bustleton Creek (ranging from 0.031 to 1.0 mg/kg), with PCB concentrations decreasing with upstream distance from the Delaware River (Ref. 2). Historically, Bustleton Creek sediments have also been analyzed for VCM, 1,2-DCE, TCE, and PCE, and all analytes were non-detect. Thus, PCBs are the only contaminant present in sediments in Bustleton Creek. PCB concentrations were detected above the NJ RDCSCC (0.49 mg/kg) but below the NJ NRDCSCC (2.0 mg/kg) at two out of five sample locations (BC-1, 1.0 mg/kg; BC-2, 0.79 mg/kg) in Bustleton Creek (Ref. 2, 3). Thus, sediment is currently considered impacted above relevant screening criteria because Bustleton Creek is located outside the facility fence line. Thus, off-site receptors (i.e., recreators, trespassers) may be impacted in this area.

Air (Outdoors)

Based upon current site conditions, there is a relatively limited areal extent of contamination present in surface soil. The Surface Ditch System is the primary concern for elevated levels of constituents in surface soil; however, soil in the surface ditches is saturated and thus migration of loose contaminated particulates into outdoor air is not likely to be a concern at the PolyOne site. VOCs in groundwater are also not expected to be a concern in outdoor air given the low contaminant concentrations currently present in groundwater.

References:

1. Site Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated March 19, 1999.
2. Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated October 12, 2000.
3. Supplemental Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated September 7, 2001.
4. Addendum to RI Report, Classification Exception Area, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated September 7, 2001.
5. Telephone conversation between Elizabeth Butler, USEPA, and Richard Burgos, NJDEP. February 4, 2002.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table
*Potential **Human Receptors** (Under Current Conditions)*

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespasser	Recreation	Food[7]
Groundwater	No	Yes	No	Yes	–	–	No
Air (indoor)							
Surface Soil (e.g. < 2 ft)	No	Yes	No	Yes	No	No	No
Surface Water							
Sediment	No	No	No	No	Yes	Yes	Yes
Subsurface Soil (e.g., > 2 ft)	–	–	–	Yes	–	–	No
Air (outdoors)							

Instruction for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. Enter "yes" or "no" for potential "completeness" under each "Contaminated"Media — Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces. These spaces instead have dashes ("–"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

___ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

__X__ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

[7] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

Rationale :

Groundwater

The shallow aquifer has been impacted by VOCs from site activities. Groundwater in the vicinity and upgradient of MW-5 and underlying the Welex Building is the primary area of contamination and will be addressed using an active remediation system (air sparging or DDC system). Groundwater in this unit is not used for potable purposes at the site (Ref. 5). Thus, there is not a concern for exposure for on-site receptors via potable use. Groundwater in this unit discharges to Bustleton Creek, and the Delaware River to a lesser extent; thus, there are no downgradient and off-site receptors of concern for groundwater exposure. A well search conducted in 1999 identified numerous wells within a one-mile radius of the site (i.e., 16 supply wells [irrigation, industrial, and public water] that withdraw more than 100,000 gallons per day, 21 supply wells that withdraw less than 100,000 gallons per day, and 8 domestic wells) (Ref. 2). All supply wells are extended to the PRM aquifer. The domestic wells, which are completed to depths ranging from 35 to 152 feet bgs, are not a concern relative to site impacts given that they are not downgradient of the site (i.e., they are all located southeast of the site on the opposite side of Bustleton Creek). Given that the depth to groundwater in the shallow aquifer is approximately 8 to 17 feet bgs, direct exposure during on-site construction activities is considered a potentially complete exposure pathway (Ref. 5).

A CEA application was submitted as an addendum to the RI Report in September 2001. The purpose of the CEA is to protect potential groundwater users and to identify the period of time and remedial measures required to attain NJ GWQC (Ref. 5). The proposed CEA boundary extends from immediately north of the site facilities (i.e., buildings) at which releases may have occurred, and extends south and southwest to Bustleton Creek, which is the current discharge area of the PCE plume (see CEA Location Map, Figure 2.3 [Ref. 7] for a depiction of the CEA boundaries). The CEA proposes to include groundwater in the shallow aquifer only. The CEA indicates that a Well Restriction Area (WRA) is not necessary at the site given that groundwater in the shallow aquifer beneath the site is not used as a potable water source. The conductivity of the shallow aquifer in this area is not conducive for development of municipal water supply wells. The CEA also indicates that "the Site and area surrounding the Site are industrial with adjacent flood plain areas making residential housing (and supply wells) unlikely." NJDEP approval of the CEA application will be provided upon activation and documented adequacy of the proposed remediation system (Ref. 6).

The two on-site production wells (PW-1 and PW-2) are completed in the PRM aquifer. PW-1 is completed in the deeper portion, and PW-2 in the shallower portion, of the PRM aquifer. PW-2 has detected concentrations of PCE (maximum concentration of 2 μg/L) from May 1998 to November 2000. The RI Report and CEA application indicate that the limited detections of PCE in the PRM aquifer demonstrates that the confining clay prevents a vertical downward migration of chemicals from the shallow aquifer to the PRM aquifer. Therefore, the only aquifer of concern for this site is the shallow aquifer. In addition, the CEA application indicates that the "presence of chlorinated solvents in the PRM aquifer near the Site is known to be ubiquitous." The CEA application argues that this is further substantiated by the presence of PCE in the upgradient well nests MW-1S/1D and MW-8S/8D, even though these wells are completed in the shallow aquifer. OCC also argues that PW-2 is upgradient from the source areas at the site, thus making it further unlikely that the PCE levels detected are resultant of site-related activities. According to NJDEP, water obtained from the production wells is not utilized for potable purposes (i.e., consumption), but is used for hand washing, toilets, and industrial purposes (Ref. 6), thereby potentially exposing on-site workers to elevated levels of PCE.

Surface/Subsurface Soil

The entire site is fenced to prevent off-site trespassers from entering the property. In addition, the site is secured and guarded. A guard house is located at the entrance to monitor all people entering and exiting

the property (Refs. 1, 3, 4). Because current use of the site is industrial, contaminants detected in soil at the site are compared to NJ NRDCSCC to evaluate potential exposure to on-site receptors.

Resin Ditch/South Ditch/CMP and CBs: PCB contamination above NJ NRDCSCC is present in surface soil in the Resin Ditch and South Ditch and in subsurface piping (CMP and CBs). However, exposure pathways to the elevated PCB contamination are not considered complete because each ditch area is fenced and secured. In addition, the physical characteristics of the ditches (side slopes, water presence) do not attract pedestrian traffic (Ref. 3). Thus on-site receptors are not expected to come in contact with the PCB contamination present in sediment in these ditch areas. The elevated PCB concentrations in the CMP and CB are located in subsurface drainage piping and thus are not a concern for an on-site worker. However, on-site construction workers may be exposed to elevated levels of PCBs during maintenance activities in the CMP or CBs.

Transformer Areas: The three transformer areas where PCBs have been detected above NJ NRDCSCC are the Fabric Transformer Area, the Silo/Compound Transformer Area, and the Recovery Transformer Area. Each of these impacted areas is located within a fenced boundary, thus preventing access to the surficial PCB contamination. There is one sample location (PS-62, 0-0.5 ft) just outside the fenced boundary in the Fabric Transformer Area that is slightly above the NJ NRDCSCC (2.1 mg/kg) (Refs. 3, 4). Thus, a potential exists for on-site workers or construction workers to be exposed to elevated PCB levels at this sample location.

Chiller House: The potential area of concern is limited to an area of soil located west of the Chiller House where PCE (maximum of 9.6 mg/kg) was detected above the NJ NRDCSCC (6.0 mg/kg) at soil sample PS-28. Samples at PS-28 were collected at four depth intervals (1.5-2.0, 3.5-4.0, 5.5-6.0, and 6.5-7.0 feet bgs) and PCE was detected above NJ NRDCSCC between 3.5 and 6.0 ft bgs (Ref. 3). Thus, although PCE contamination in this area is not a concern for direct exposure to on-site workers, on-site construction workers may be exposed to PCE contamination in the subsurface during intrusive activities.

Former PCE Drum Storage Area: PCE was detected (20 mg/kg) at one sample location (PS-25) above the NJ NRDCSCC (6.0 mg/kg) from 1.5 to 2.0 ft bgs. On-site workers and construction workers may be exposed to elevated levels of PCE in this area. However, because available file materials indicate that this area is covered by pavement or cement (see Surface Characteristics Map, Figure 1.3 [Ref. 1]), direct exposure in this area is not a concern.

Former 1,000-gallon No. 2 Fuel Oil UST: PCE contamination in this area was detected below the NJ NRDCSCC, and thus is not a concern for direct exposure for on-site workers or construction workers.

300,000-gallon Aboveground No. 6 Fuel Oil Tank: TPH was detected (20,900 mg/kg) in surface soil (0 to 0.5 ft bgs) at one sample location (AST-1) above the NJDEP-approved soil cleanup criterion (10,000 mg/kg). However, the impacted area is surrounded with a fence to prevent access to the contamination. Thus, there is no potential for on-site workers or construction workers to be exposed to the elevated levels of TPH in this area (Ref. 3).

It should be noted that a Remedial Action Implementation Report will be submitted upon completion of proposed remedial actions for soil and groundwater at the site (Refs. 3, 4). As mentioned in Question #1, OCC and PolyOne have recently negotiated alternate remedial actions for soil at the site that include excavation and off-site disposal of all impacted soil at the site above the NJ RDCSCC. OCC planned to remediate soil to relevant industrial cleanup standards (i.e., NJ RDCSCC or other NJDEP-approved site-specific criterion). However, PolyOne (the current site owner) has decided to perform this additional soil excavation and meet this more stringent cleanup criteria (i.e., NJ RDCSCC) to avoid the need for a Deed

Notice at the property (Ref. 6). Excavations began in February 2002 (Ref. 6). Thus, upon completion of soil excavation activities, all impacted soil above NJ RDCSCC will be removed from the site, thereby eliminating all concerns for soil exposure at the site.

Sediment

PCBs were detected above the NJ RDCSCC (BC-1, 1.0 mg/kg; BC-2, 0.79 mg/kg) at two sample locations in Bustleton Creek (Refs. 3, 4). Bustleton Creek is outside the facility fence line and thus is not a concern for direct exposure to on-site receptors. However, off-site trespassers and recreators may possibly come in contact with the slightly elevated PCB concentrations detected in sediment. In addition, PCBs in sediment have a potential to bioaccumulate in fish populations foraging in Bustleton Creek. Thus, there is a potential that recreational receptors may be exposed to elevated levels of PCBs while ingesting fish caught in Bustleton Creek.

References:

1. Site Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated March 19, 1999.
2. Well Search Results Report Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated May 21, 1999.
3. Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated October 12, 2000.
4. Supplemental Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated September 7, 2001.
5. Addendum to RI Report, Classification Exception Area, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated September 7, 2001.
6. Telephone conversation between Elizabeth Butler, USEPA, and Richard Burgos, NJDEP. February 4, 2002.

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **significant**[8] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks?

   _X_ If no (exposures cannot be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

   ____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

   ____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale :

Groundwater

Direct exposure to groundwater (i.e, dermal contact, incidental ingestion, inhalation) during on-site construction activities is not expected to pose significant risk to an on-site construction worker. Contamination at the site is well documented and intrusive activities at the site are performed in accordance with the on-site health and safety procedures (Ref. 5). Workers follow Occupational Safety and Health Administration (OSHA) guidelines and wear appropriate personal protective equipment (PPE) when conducting intrusive activities at the site. Thus, it is unlikely that exposure to PCE and TCE contamination in the shallow aquifer would be significant for an on-site construction worker.

On-site worker exposure to groundwater (i.e., dermal contact, incidental ingestion, inhalation) obtained from PW-2 is not expected to be significant. The SI Report indicates that PW-1 is the primary production well at the site. This well has been periodically sampled with no historic detections of VOCs. PW-2 is only used during periods requiring additional water for heat exchange (i.e., during the hot summer months). The SI Report indicates that PW-2 was only used for several days during 1998. Thus, exposure to the low levels of PCE detected in PW-2 are expected to be extremely limited in duration and insignificant. It should also be noted that the facility argues that contamination in the area of PW-2 is not site-related but is "representative of general groundwater conditions in the industrial area within which the Site is located" (Refs. 1, 2, and 4). The SI, RI, and SRI Reports argue that this argument is supported by the fact that PW-2 is upgradient of all source areas at the site, and that upgradient (i.e., background) shallow wells (MW-1S/1D, MW-8S/8D) have also historically shown impacts of PCE above NJ GWQC (7 μg/L in MW-1S and 1 μg/L in MW-8D during Fourth Quarter 2000). NJDEP has approved the SI, RI, and SRI Reports, which have indicated contamination in the PRM aquifer is not site related. Thus, impacts to PW-2 are not attributable to the PolyOne site.

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[8] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

Surface/Subsurface Soil

Resin Ditch/South Ditch/CMP and CBs: PCB contamination is present (maximum of 25 mg/kg) in the CMP and CBs at levels above NJ NRDCSCC (2 mg/kg). An on-site construction worker may be exposed to contamination in the CMP or CBs while performing routine maintenance activities. However, contamination at the site is well documented and intrusive activities at the site are preformed in accordance with the on-site health and safety procedures (Ref. 5). Construction workers are expected to follow OSHA guidelines and wear appropriate PPE when conducting intrusive activities at the site. Thus, it is unlikely that exposure to PCB contamination in this area would be significant for an on-site construction worker.

Chiller House: PCE contamination above the NJ NRDCSCC in this area is only present in the subsurface (3.5 to 6.0 ft bgs) at one sample location (PS-28). Thus, an on-site construction worker may be exposed to contamination in this area while conducting intrusive activities. However, contamination at the site is well documented and intrusive activities at the site are preformed in accordance with the on-site health and safety procedures (Ref. 5). Construction workers are expected to follow OSHA guidelines and wear appropriate PPE when conducting intrusive activities at the site. Thus, it is unlikely that exposure to PCE contamination in this area would be significant for an on-site construction worker.

Transformer Areas: The Fabric Transformer Area contains one sample location just outside the small fenced area that contains PCBs at 2.1 mg/kg from 0.0 - 0.5 ft bgs. Results from 1.5 to 2.0 ft bgs showed PCBs were not detected. Other soil samples collected outside the perimeter of the fenced transformer area were all below the NJ NRDCSCC of 2.0 mg/kg. Given the limited extent of PCB soil contamination outside the fenced transformer area, it is not expected to pose significant concern to on-site receptors. The SI and RI Reports indicate that the transformer areas are in low-traffic areas, and it is unlikely that an on-site worker would routinely be exposed to enough PCB contamination to present a significant risk.

As mentioned in Question #3, all soil impacted with contamination above NJ RDCSCC will be excavated and removed from the site as part of the recently negotiated remedial actions between OCC and PolyOne. Excavation of impacted soil to the more stringent cleanup criteria will eliminate the need for a Deed Notice at the site. Excavations began in February 2002 and are expected to be completed in the Spring of 2002 (Ref. 5). Upon completion of soil excavation activities, all impacted soil above NJ RDCSCC will be removed from the site, thus eliminating all concerns for soil exposure at the site.

Sediment

The SI included an ecological evaluation of the risks associated with the PCB contamination in sediment in Bustleton Creek. The ecological evaluation concluded that the potential risk for human receptors (e.g., via ingestion of fish) from the PCBs detected in Bustleton Creek was likely to be minimal for the following reasons. First, the detected PCB formulation (Aroclor 1242) has limited potential for both bioacccumulation and toxicity. Second, the affected area is small in size and, due to its tidal nature, is not prime foraging habitat for fish. Thus, the ecological evaluation determined that potential exposure associated with ingestion of fish from Bustleton Creek was not expected to be significant. Nor were the concentrations detected in Bustleton Creek expected to cause significant impacts on ecological receptors. NJDEP determined that because surface water and sediment samples detected no significant impacts and the ecological evaluation documented no adverse impact on ecological receptors, no further investigation of sediments in Bustleton Creek was required (Ref. 3).

As previously mentioned, PCBs were only detected at two out of five sample locations above the NJ RDCSCC (BC-1, 1.0 mg/kg; BC-2, 0.79 mg/kg) (Refs.3, 4). The detected concentrations are only slightly above the NJ RDCSCC (0.49 mg/kg) and below the NJ NRDCSCC (2.0 mg/kg). Available

documentation does not provide specific information on the use of Bustleton Creek in the vicinity of the site. However, the SI Report indicates that Bustleton Creek consists of a series of long, shallow pools (less than six inches deep) with little net flow, in the vicinity of the site. Thus, it would be unlikely that potential receptors (i.e., recreators, trespassers) would submerge their entire body in Bustleton Creek. Rather, if receptors were in the vicinity of the site, they would simply wade in the Creek, and experience limited exposure to sediments on the hands and feet.

Given that PCBs were not deemed a concern for ecological receptors, and given the limited extent and relatively low concentrations of PCBs detected in Bustleton Creek, potential exposure to off-site receptors (i.e., recreators, trespassers) is expected to be insignificant (Ref. 2).

References:

1. Site Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated March 19, 1999.
2. Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated October 12, 2000.
3. Letter from Wayne Howitz, NJDEP, to David P. Steele, Glenn Springs Holdings, Inc., re: Remedial Investigation Report, dated October 12, 2000, Draft Response to Draft Comments on the RI Report dated January 19, 2001. Dated August 13, 2001.
4. Supplemental Remedial Investigation Report, Occidental Chemical Corporation. Prepared by Conestoga-Rovers & Associates. Dated September 7, 2001.
5. Telephone conversation between Elizabeth Butler, USEPA, and Richard Burgos, NJDEP. February 4, 2002.

5. Can the "significant" **exposures** (identified in #4) be shown to be within acceptable limits?

____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale :

This question is not applicable. See response to question #4.

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

_X_ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the PolyOne Corp. facility (fka Occidental Chemical Corporation), EPA ID# NJD043973122, located at 1804 River Road, Burlington, New Jersey, under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

___ NO - "Current Human Exposures" are NOT "Under Control."

___ IN - More information is needed to make a determination.

Completed by: _____ Date:_____

Kristin McKenney
Risk Assessor

Booz Allen Hamilton

Reviewed by: _____ Date:_____
Kathy Rogovin
Senior Risk Assessor
Booz Allen Hamilton

Also Reviewed by: _____ Date:_____
Elizabeth Butler, RPM
RCRA Programs Branch
USEPA Region 2

_____ Date:_____
Barry Tornick, Section Chief
RCRA Programs Branch
USEPA Region 2

Approved by: Original signed by: Date: May 10, 2002
Raymond Basso, Chief
RCRA Programs Branch
USEPA Region 2

Locations where references may be found:

References reviewed to prepare this EI determination are identified after each response. Reference materials are available at the USEPA Region 2, RCRA Records Center, located at 290 Broadway, 15th Floor, New York, New York, and the New Jersey Department of Environmental Protection Office located at 401 East State Street, Records Center, 6th Floor, Trenton, New Jersey.

Contact telephone and e-mail numbers: Andy Park, USEPA RPM
(212) 637-4184
mailto:park.andy@aol.com

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

Attachments

The following attachments have been provided to support this EI determination.

- Attachment 1 - Summary of Media Impacts Table

Attachment 1 - Summary of Media Impacts Table

PolyOne Corp. (fka Occidental Chemical Corporation)

AOC	GW	AIR (Indoors)	SURF SOIL	SURF WATER	SED	SUB SURF SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	CONTAMINANTS
Resin Ditch/South Ditch/CMPs/CBs	No	No	Yes	No	No	Yes	No	▸ Fencing surrounds all impacted areas ▸ Planned excavation and off-site disposal of PCB-impacted soil above NJ RDCSCC	PCBs
Transformers	No	No	Yes	No	No	No	No	▸ Fencing surrounds all impacted transformer areas ▸ Planned excavation and off-site disposal of PCB-impacted soil above NJ RDCSCC	PCBs
Former VCM Recovery Area	No	No	No	No	No	No	No	NA	NA
Former PCE Drum Storage Area	Yes	No	Yes	No	No	No	No	▸ Area included in CEA to address contamination above NJ IGWSCC ▸ Area covered by concrete/asphalt ▸ Planned excavation and off-site disposal of PCE-impacted soil above NJ RDCSCC	PCE
Chiller House	Yes	No	No	No	No	Yes	No	▸ Area included in CEA to address groundwater contamination above NJ GWQC and soil contamination above NJ IGWSCC ▸ Planned excavation and off-site disposal of PCE-impacted soil above NJ RDCSCC	PCE
Former USTs (1,000-gallon No. 2 Fuel Oil UST)	Yes	No	No	No	No	Yes	No	▸ Area included in CEA to address groundwater contamination above NJ GWQC and soil contamination above NJ IGWSCC ▸ Planned excavation and off-site disposal of PCE-impacted soil above NJ RDCSCC	PCE

AOC	GW	AIR (Indoors)	SURF SOIL	SURF WATER	SED	SUB SURF SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	CONTAMINANTS
Welex Building	Yes	No	No	No	No	No	No	▸ Area included in CEA to address contamination above the NJ GWQC	PCE, TCE
Empty Drum Storage Area	No	No	No	No	No	No	No	NA	NA
Obsolete Equipment Storage Area	No	No	No	No	No	No	No	NA	NA
Resin Building	No	No	No	No	No	No	No	NA	NA
Bulk Storage Tanks (300,000 gallon Aboveground No. 6 Fuel Oil Tank)	No	No	Yes	No	No	No	No	▸ Fencing surrounds area to prevent exposure ▸ Planned excavation of TPH impacted soil down to clay layer	TPH
Current Drum Storage Area	No	No	No	No	No	No	No	NA	NA
Process Lines/Equipment/ Material Handling Areas	No	No	No	No	No	No	No	NA	NA
Groundwater	Yes							▸ Install an active groundwater remediation system (i.e., air sparging or DDC system) to reduce concentrations of contaminants in groundwater ▸ Implement CEA ▸ Continue groundwater monitoring	PCE, TCE

NA - Not applicable

* Groundwater contamination is being addressed on a site-wide basis. However, for purposes of relating impacts to potential source areas, specific areas where groundwater impacts have been shown are identified in the table.